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L1 and L4	90

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L5





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<i>DB=PGPB,USPT,USOC; PLUR=YES; OP=OR</i>			
<u>L5</u>	L1 and L4	90	<u>L5</u>
<u>L4</u>	710/301,1-2,300-304,100,62,72;361/679-686;711/115.ccls.	10816	<u>L4</u>
<i>DB=EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR</i>			
<u>L3</u>	L2	0	<u>L3</u>
<i>DB=PGPB,USPT,USOC; PLUR=YES; OP=OR</i>			
<u>L2</u>	L1 same slot same adapter	25	<u>L2</u>
<u>L1</u>	(removable or replacable or extractable) same expansion same (module or unit)	3180	<u>L1</u>

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Terms	Documents
L5 and (slot same adapter)	20

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L6





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<u>L6</u>	L5 and (slot same adapter)	20	<u>L6</u>
<u>L5</u>	l1 and L4	90	<u>L5</u>
<u>L4</u>	710/301,1-2,300-304,100,62,72;361/679-686;711/115.ccls.	10816	<u>L4</u>
<i>DB=EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR</i>			
<u>L3</u>	L2	0	<u>L3</u>
<i>DB=PGPB,USPT,USOC; PLUR=YES; OP=OR</i>			
<u>L2</u>	L1 same slot same adapter	25	<u>L2</u>
<u>L1</u>	(removable or replacable or extractable) same expansion same (module or unit)	3180	<u>L1</u>

END OF SEARCH HISTORY

## Refine Search

### Search Results -

Terms	Documents
L1 same slot same adapter	25

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L2





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<i>DB=PGPB,USPT,USOC; PLUR=YES; OP=OR</i>			
<u>L2</u>	L1 same slot same adapter	25	<u>L2</u>
<u>L1</u>	(removable or replacable or extractable) same expansion same (module or unit)	3180	<u>L1</u>

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### Search Results -

Terms	Documents
L2	0

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L3  





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side by side			
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<i>DB=PGPB,USPT,USOC; PLUR=YES; OP=OR</i>			
<u>L2</u>	L1 same slot same adapter	25	<u>L2</u>
<u>L1</u>	(removable or replacable or extractable) same expansion same (module or unit)	3180	<u>L1</u>

END OF SEARCH HISTORY

## Refine Search

### Search Results -

Terms	Documents
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Search:

L4





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<u>L3</u>	L2	0	<u>L3</u>
<i>DB=PGPB,USPT,USOC; PLUR=YES; OP=OR</i>			
<u>L2</u>	L1 same slot same adapter	25	<u>L2</u>
<u>L1</u>	(removable or replacable or extractable) same expansion same (module or unit)	3180	<u>L1</u>

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EAST - [Untitled1:1]

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Trash

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Default operator: OR

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	Type	L #	Hits	Search Text	DBs	Time Stamp	Comments	Error Definition	Err
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2	BRS	L2	2	11 same slot same adapter	USPAT	2004/11/23 10:47			

Start EAST - [Untitled1:1]

EAST - [Untitled1:1]

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L2: (2) l1 same slot same ad  
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l1 same slot same adapter

BRS form IS&R form Image Text HTML

	U	I	Document ID	Issue Date	Pages	Title	Current OR	Current XRef R
1	<input type="checkbox"/>	<input type="checkbox"/>	US 6691196 B2	20040210	24	First-level removable module having bar code I/O and	710/301	361/684; 361/686;
2	<input type="checkbox"/>	<input type="checkbox"/>	US 6599147 B1	20030729	48	High-density removable expansion module having I/O	439/377	439/76.1; 439/946

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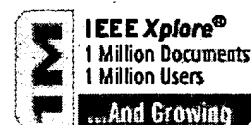
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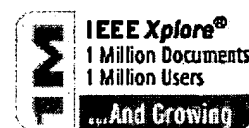
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**1 Using text corpora for understanding polysemy in Bangla***Dash, N.S.; Chaudhuri, B.B.;*

Language Engineering Conference, 2002. Proceedings , 13-15 Dec. 2002

Pages:99 - 109

[\[Abstract\]](#)
[\[PDF Full-Text \(292 KB\)\]](#)
**IEEE CNF****2 A generalized algorithm for the capacitance extraction of 3D VLSI interconnects***Zhenhai Zhu; Wei Hong;*

Microwave Theory and Techniques, IEEE Transactions on , Volume: 47 , Issue 10 , Oct. 1999

Pages:2027 - 2030

[\[Abstract\]](#)
[\[PDF Full-Text \(168 KB\)\]](#)
**IEEE JNL****3 A fully additive, polymeric process for the fabrication and assembly substrate and component level packaging***Gallagher, C.; Gandhi, P.; Matijasevic, G.;*

The First IEEE International Symposium on Polymeric Electronics Packaging , Oct. 1997

Pages:56 - 63

[\[Abstract\]](#)
[\[PDF Full-Text \(908 KB\)\]](#)
**IEEE CNF****4 A virtual interface bus for portable PCs***Burris, D.; Cargile, F.M.; Dalton, A.;*

AUTOTESTCON '99. IEEE Systems Readiness Technology Conference, 1999.

IEEE , 30 Aug.-2 Sept. 1999

Pages:81 - 86

[\[Abstract\]](#) [\[PDF Full-Text \(440 KB\)\]](#) **IEEE CNF**

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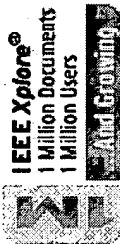
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## A virtual interface bus for portable PCs

Burris, D. Cargile, F.M. Dalton, A.  
Eng. Spectrum Inc., San Antonio, TX, USA;

*This paper appears in: AUTOTESTCON '99. IEEE Systems Readiness Technology Conference, 1999. IEEE*

Meeting Date: 08/30/1999 - 09/02/1999

Publication Date: 30 Aug.-2 Sept. 1999

Location: San Antonio, TX USA

On page(s): 81 - 86

Reference Cited: 0


Number of Pages: xxix+830

Inspection Accession Number: 6512885

### Abstract:

There is a growing demand in the automatic test industry for downsized and portable test systems. As a result, laptop and hand held PCs are now becoming more common in the test arena. However, there is a need to standardize and simplify both hardware and software **interfaces** between the laptop PC, test equipment, and the **unit** under test. This paper describes the development of a Virtual **Interface** Bus (VIBus) which consolidates multiple industry standard communication **interface** protocols into one driver/manager for a laptop or hand held PC application. The development was directed

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to incorporate the requirements of the IEEE-488, RS-422, Mil-Std-1553, and RS-232 bus protocols into a driver/manager that can be integrated into weapon system test platforms using portable PCs. The successful completion of the project solves two major existing problems: (1) A VIBus software driver/manager allows any of the communication **interfaces** to be used seamlessly; (2) All of the required **interface** protocols can be included in a standard laptop PC simultaneously. The solution involves the development of a PCMCIA bus expander that allows many COTS PCMCIA **interface** cards to be used without **removing** and **replacing** cards. The VIBus driver/manager selects the appropriate **interface** card and drivers as called for by a particular test or data retrieval program, or at the direction of a user

**Index Terms:**

automatic test equipment automatic test software device drivers memory expansion boards  
peripheral interfaces portable computers virtual instrumentation COTS PCMCIA interface cards  
IEEE-488 Mil-Std-1553 PCMCIA bus expander RS-232 bus protocol RS-422 bus protocol  
VIBus software automatic test equipment driver/manager multiple industry standard  
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L2: Entry 1 of 25

File: PGPB

Mar 11, 2004

DOCUMENT-IDENTIFIER: US 20040048503 A1

TITLE: High-density removable expansion module having I/O and second-level-removable expansion memory

Summary of Invention Paragraph:

[0003] The broad use of portable host computers, including laptops, notebooks, palmtops, Personal Digital Assistants (PDAs), and hand-held computers (hand-helds), has been severely hampered by limited capabilities for expansion or customization. Expansion and application customization has been performed via only one, or at most two, slots for removable expansion modules for I/O, I/O adapters, memories, and memory adapters. Memory expansion cards have included DRAM, SRAM, ROM, and Flash technologies. I/O expansion modules have included dedicated peripherals, networking, modems, wireless communications, serial I/O, and bar-code and other scanners.

Detail Description Paragraph:

[0176] At the system level, the invention is not limited to the illustrated embodiments in which a removable expansion module with second-level-removable expansion memory is directly plugged into a computing host, but is equally applicable to situations in which one or more intervening adapters or dongles is used to adapt or couple between the interfaces of the expansion module and a computing host device or system. In a specific but not limiting example, the invention is applicable to the use of a CF Card with a CF-to-PC Card adapter, so that a CF Card according to the present invention can operate indirectly in a PC Card slot.

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File: PGPB

Mar 11, 2004

PGPUB-DOCUMENT-NUMBER: 20040048503  
PGPUB-FILING-TYPE: new  
DOCUMENT-IDENTIFIER: US 20040048503 A1

TITLE: High-density removable expansion module having I/O and second-level-removable expansion memory

PUBLICATION-DATE: March 11, 2004

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Mills, Kevin J.	Palo Alto	CA	US	
Gifford, Micheal L.	San Leandro	CA	US	

APPL-NO: 10/ 449867    [\[PALM\]](#)  
DATE FILED: May 30, 2003

## RELATED-US-APPL-DATA:

Application 10/449867 is a continuation-of US application 09/439966, filed November 12, 1999, US Patent No. 6599147  
Application 09/439966 is a continuation-in-part-of US application 09/309373, filed May 11, 1999, US Patent No. 6353870

INT-CL: [07] [H01](#) [R](#) [12/00](#)

US-CL-PUBLISHED: 439/076.1  
US-CL-CURRENT: [439/76.1](#)

REPRESENTATIVE-FIGURES: 12

## ABSTRACT:

The utility of portable computer hosts, such as PDAs (or hand-helds), is enhanced by methods and apparatus for removable expansion cards having application specific circuitry, a second-level-removable memory, and optional I/O, in a number of illustrative embodiments. In addition to providing greater expansion utility in a compact and low profile industrial design, the present invention permits memory configuration versatility for application specific expansion cards, permitting easy user field selection and upgrades of the memory used in conjunction with the expansion card. Finally, from a system perspective, the present invention enables increased parallelism and functionality previously not available to portable computer devices.

## CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This patent application is a continuation of U.S. application Ser. No. 09/439,966, HIGH-DENSITY REMOVABLE EXPANSION MODULE HAVING I/O AND SECOND-LEVEL-

REMOVABLE EXPANSION MEMORY, filed Nov. 12, 1999, which is a continuation-in-part of U.S. Application Serial No. 09/309,373, CLOSED-CASE REMOVABLE EXPANSION CARD HAVING I/O AND REMOVABLE MEMORY, filed May 11, 1999, all of the foregoing applications being incorporated by reference herein.

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L2: Entry 8 of 25

File: USPT

Feb 10, 2004

US-PAT-NO: 6691196

DOCUMENT-IDENTIFIER: US 6691196 B2

TITLE: First-level removable module having bar code I/O and second-level removable memory

DATE-ISSUED: February 10, 2004

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Mills; Kevin J.	Palo Alto	CA		
Gifford; Micheal L.	San Leandeo	CA		

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Socket Communications, Inc.	Newark	CA			02

APPL-NO: 10/ 036468 [PALM]

DATE FILED: January 7, 2002

## PARENT-CASE:

This application is a continuation of application Ser. No. 09/309,373 filed May 11, 1999 now U.S. Pat. No. 6,353,870.

INT-CL: [07] G06 F 13/00, G06 F 1/16

US-CL-ISSUED: 710/301; 710/2, 711/115, 361/684, 361/686

US-CL-CURRENT: 710/301; 361/684, 361/686, 710/2, 711/115

FIELD-OF-SEARCH: 710/300-304, 710/2, 361/679-686, 711/115

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## U.S. PATENT DOCUMENTS

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<input type="checkbox"/>	<u>5887145</u>	March 1999	Harari et al.	395/282
<input type="checkbox"/>	<u>5892213</u>	April 1999	Ito et al.	235/441
<input type="checkbox"/>	<u>5906516</u>	May 1999	Sato et al.	439/630
<input type="checkbox"/>	<u>5928347</u>	July 1999	Jones	710/129
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<input type="checkbox"/>	<u>6085412</u>	July 2000	Iwasaki	29/827
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<input type="checkbox"/>	<u>6097605</u>	August 2000	Klatt et al.	361/737
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<input type="checkbox"/>	<u>6222726</u>	April 2001	Cha	361/683
<input type="checkbox"/>	<u>6293464</u>	September 2001	Smalley, Jr.	235/435

## OTHER PUBLICATIONS

MultiMediaCard System Summay Version 2.0, MMCA, Jan. 1999.  
 Wes Brewer, Smart Solutions for Smart Phones, SanDisk Corporation, 1998.  
 CompactFlash Specification Revision 1.3, CompactFlash Association, 1998.  
 PC Cards and CompactFlash Size CF+Cards for Ethernet, Serial Communications, Bar

Code Scanning and Data Collection, Socket Communications, Inc., 1998.  
ScanDisk CompatFlashSanDisk Corporation, Apr. 1998.  
SanDisk MultiMediaCard, SanDisk Corporation, Nov. 1997.  
Apr. 30, 2001 PCT Written Opinion for related International application No.  
PCT/US00/12796, filed May 9, 2000.

ART-UNIT: 2189

PRIMARY-EXAMINER: Lefkowitz; Sumati

ATTY-AGENT-FIRM: PatentVentures Smith; Bennett Van Dyke; Korbin

ABSTRACT:

Computer hosts, such as PDAs, are customized for use in bar code scanner applications through use of a first-level removable expansion module having bar code related circuitry and a slot and internal connector for a second-level removable memory. In combination with a connected or attached I/O device for scanning bar codes, these modules provide embedded bar code scanning I/O adapter and/or application-specific functions as well as second-level removable memory functions. The removable memory may be used to store a backup copy of the scanned data for restoration in the event the original scan data is lost or corrupted. Restoration may occur using any interface compatible with the removable memory. The removable memory may also be used by the bar code scanner application specific circuitry within the first-level removable expansion module. In illustrative embodiments, an industry standard physical and electrical interface couples the application specific module to the computer host, which provides user interface functions for the application.

44 Claims, 20 Drawing figures

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L2: Entry 9 of 25

File: USPT

Jul 29, 2003

US-PAT-NO: 6599147

DOCUMENT-IDENTIFIER: US 6599147 B1

TITLE: High-density removable expansion module having I/O and second-level-removable expansion memory

DATE-ISSUED: July 29, 2003

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Mills; Kevin J.	Palo Alto	CA		
Gifford; Michael L.	San Leandro	CA		

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Socket Communications, Inc.	Newark	CA			02

APPL-NO: 09/ 439966 [\[PALM\]](#)

DATE FILED: November 12, 1999

## PARENT-CASE:

CROSS-REFERENCE TO RELATED APPLICATIONS This patent application is a continuation-in-part of the following commonly owned and U.S. patent application: U.S. application Ser. No. 09/309,373, CLOSED-CASE REMOVABLE EXPANSION CARD HAVING I/O AND REMOVABLE MEMORY, filed May 11, 1999 now U.S. Pat. No. 6,353,870, which is incorporated by reference herein.

INT-CL: [07] [H01](#) [R](#) [13/64](#)

US-CL-ISSUED: 439/377; 439/946, 439/76.1

US-CL-CURRENT: [439/377](#); [439/76.1](#), [439/946](#)

FIELD-OF-SEARCH: 439/377, 439/946, 439/74, 439/75, 439/76.1, 361/737, 361/752, 361/796, 361/683

PRIOR-ART-DISCLOSED:

## U.S. PATENT DOCUMENTS

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<input type="checkbox"/>	<a href="#">4744006</a>	May 1988	Dufield	361/686
<input type="checkbox"/>	<a href="#">5049728</a>	September 1991	Rovin	235/492

<input type="checkbox"/>	<u>5184282</u>	February 1993	Kaneda et al.	361/395
<input type="checkbox"/>	<u>5291584</u>	March 1994	Challa et al.	395/500
<input type="checkbox"/>	<u>5491774</u>	February 1996	Norris et al.	395/2.79
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<input type="checkbox"/>	<u>5545057</u>	August 1996	Tan et al.	439/540.1
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<input type="checkbox"/>	<u>5563400</u>	October 1996	Le Roux	235/486
<input type="checkbox"/>	<u>5566290</u>	October 1996	Silverbrook	395/173
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<input type="checkbox"/>	<u>5611055</u>	March 1997	Krishan et al.	395/281
<input type="checkbox"/>	<u>5611057</u>	March 1997	Pecone et al.	710/102
<input type="checkbox"/>	<u>5615344</u>	March 1997	Corder	395/309
<input type="checkbox"/>	<u>5619396</u>	April 1997	Gee et al.	361/686
<input type="checkbox"/>	<u>5661635</u>	August 1997	Huffman et al.	361/684
<input type="checkbox"/>	<u>5663901</u>	September 1997	Wallace et al.	365/52
<input type="checkbox"/>	<u>5671374</u>	September 1997	Postman et al.	395/309
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<input type="checkbox"/>	<u>5839108</u>	November 1998	Daberko et al.	704/270
<input type="checkbox"/>	<u>5876218</u>	March 1999	Liebenow et al.	439/74
<input type="checkbox"/>	<u>5887145</u>	March 1999	Harari et al.	395/282
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<input type="checkbox"/>	<u>5906516</u>	May 1999	Sato et al.	439/630
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<input type="checkbox"/>	<u>6293464</u>	September 2001	Smalley, Jr.	235/435

## OTHER PUBLICATIONS

MultiMediaCard System Summay Version 2.0, MMCA, Jan. 1999.

Wes Brewer, Smart Solutions for Smart Phones, SanDisk Corporation, 1998.  
CompactFlash Specification Revision 1.3 CompactFlash Association, 1998.  
PC Cards and CompactFlash Size CF+ Cards and Ethernet, Serial Communications, Bar  
Code Scanning and Data Collection, Socket Communications, Inc., 1998.  
SanDisk CompactFlash, SanDisk Corporation, Apr. 1998.  
SanDisk MultiMediaCard, SanDisk Corporation, Nov. 1997.  
Apr. 30, 2001 PCT Written Opinion for related International application No.  
PCT/US00/12796, filed May 9, 2000.

ART-UNIT: 2833

PRIMARY-EXAMINER: Bradley; P. Austin

ASSISTANT-EXAMINER: Leon; Edwin A.

ATTY-AGENT-FIRM: PatentVentures Smith; Bennett Van Dyke; Korbin

ABSTRACT:

The utility of portable computer hosts, such as PDAs (or handhelds), is enhanced by methods and apparatus for removable expansion cards having application specific circuitry, a second-level-removable memory, and optional I/O, in a number of illustrative embodiments. In addition to providing greater expansion utility in a compact and low profile industrial design, the present invention permits memory configuration versatility for application specific expansion cards, permitting easy user field selection and upgrades of the memory used in conjunction with the expansion card. Finally, from a system perspective, the present invention enables increased parallelism and functionality previously not available to portable computer devices.

36 Claims, 42 Drawing figures

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L2: Entry 10 of 25

File: USPT

Mar 5, 2002

US-PAT-NO: 6353870

DOCUMENT-IDENTIFIER: US 6353870 B1

TITLE: Closed case removable expansion card having interconnect and adapter circuitry for both I/O and removable memory

DATE-ISSUED: March 5, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Mills; Kevin J.	Palo Alto	CA		
Gifford; Micheal L.	San Leandro	CA		

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Socket Communications Inc.	Newark	CA			02

APPL-NO: 09/ 309373   [\[PALM\]](#)

DATE FILED: May 11, 1999

INT-CL: [07] [G06 F 13/00](#), [G06 F 1/16](#)

US-CL-ISSUED: 710/301; 361/684, 361/686, 710/2, 711/115

US-CL-CURRENT: [710/301](#); [361/684](#), [361/686](#), [710/2](#), [711/115](#)

FIELD-OF-SEARCH: 710/300-304, 710/2, 361/679-686

PRIOR-ART-DISCLOSED:

## U.S. PATENT DOCUMENTS

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<input type="checkbox"/> <a href="#">5049728</a>	September 1991	Rovin	235/492
<input type="checkbox"/> <a href="#">5184282</a>	February 1993	Kaneda et al.	361/737
<input type="checkbox"/> <a href="#">5291584</a>	March 1994	Challa et al.	395/500
<input type="checkbox"/> <a href="#">5491774</a>	February 1996	Norris et al.	395/2.79
<input type="checkbox"/> <a href="#">5519577</a>	May 1996	Dudas et al.	361/737
<input type="checkbox"/> <a href="#">5545057</a>	August 1996	Tan et al.	439/540.1

<input type="checkbox"/>	<u>5550709</u>	August 1996	Iwasaki	361/684
<input type="checkbox"/>	<u>5563400</u>	October 1996	Le Roux	235/486
<input type="checkbox"/>	<u>5566290</u>	October 1996	Silverbrook	395/173
<input type="checkbox"/>	<u>5579430</u>	November 1996	Grill et al.	395/2.12
<input type="checkbox"/>	<u>5611055</u>	March 1997	Krishan et al.	710/101
<input type="checkbox"/>	<u>5611057</u>	March 1997	Pecone et al.	710/102
<input type="checkbox"/>	<u>5615344</u>	March 1997	Corder	710/129
<input type="checkbox"/>	<u>5619396</u>	April 1997	Gee et al.	361/686
<input type="checkbox"/>	<u>5661635</u>	August 1997	Huffman et al.	361/684
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<input type="checkbox"/>	<u>5892213</u>	April 1999	Ito et al.	235/441
<input type="checkbox"/>	<u>5928347</u>	July 1999	Jones	710/129
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<input type="checkbox"/>	<u>6053748</u>	April 2000	Bricaud et al.	439/76.1
<input type="checkbox"/>	<u>6085412</u>	July 2000	Iwasaki	29/827
<input type="checkbox"/>	<u>6091137</u>	July 2000	Fukuda	257/679
<input type="checkbox"/>	<u>6097605</u>	August 2000	Klatt et al.	361/737

## OTHER PUBLICATIONS

Apr. 30, 2001 PCT Written Opinion for related International application No.

PCT/US00/12796, filed May 09, 2000.

MultiMediaCard System Summay Version 2.0, MMCA, Jan. 1999.

Wes Brewer, Smart Solutions for Smart Phones, SanDisk Corporation, 1998.

CompactFlash Specification Revision 1.3, CompactFlash Association, 1998.

PC Cards and CompactFlash Size CF+ Cards for Ethernet, Serial Communications, Bar

Code Scanning and Data Collection, Socket Communications, Inc., 1998.

SanDisk CompactFlash, SanDisk Corporation, Apr. 1998.

SanDisk MultiMediaCard, SanDisk, Corporation, Nov. 1997.

ART-UNIT: 2181

PRIMARY-EXAMINER: Lefkowitz; Sumati

ATTY-AGENT-FIRM: Smith; Bennett



## ABSTRACT:

Methods and apparatus for closed-case removable expansion cards having a removable memory enhance the utility of portable computer hosts, such as PDAs. In both a first and second embodiments the closed-case removable expansion cards preferably use a Type II CompactFlash form factor. In the first embodiment the removable memory is in combination with an external-I/O connector or attached external-I/O device, providing both I/O and memory functions in a single closed-case removable expansion card. This increases the expansion functional density for portable computer hosts, such as PDAs. That is, it increases the amount of functionality that can be accommodated within a given volume allocation for expansion devices. In the second embodiment the removable memory is a private memory for application specific circuitry within the closed-case-removable expansion card. This enhances the utility of portable computer hosts, such as PDAs, as universal chassis for application specific uses. The standard CompactFlash physical and electrical interface couples the application specific card to the host, which provides user interface functions for the application. The cards include a top located slot and an internal connector for accepting a MultiMediaCard as the private removable memory. In addition, the application specific card will generally have some manner of I/O to required external devices, such as scanning devices, sensors, or transducers. Otherwise, all functionality for the application specific function is self-contained within the application specific card.

40 Claims, 20 Drawing figures

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L2: Entry 11 of 25

File: USPT

Apr 14, 1998

US-PAT-NO: 5740020

DOCUMENT-IDENTIFIER: US 5740020 A

TITLE: Computer housing and expansion card format for consumer electronics devices

DATE-ISSUED: April 14, 1998

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Palatov; Dennis	Aliso Viejo	CA	92656	

APPL-NO: 08/ 791472   [\[PALM\]](#)

DATE FILED: January 27, 1997

## PARENT-CASE:

This is a division of U.S. patent application Ser. No. 08/605,278 filed Feb. 7, 1996.

INT-CL: [06] [H05 K 7/14](#), [H01 R 23/68](#)

US-CL-ISSUED: 361/796; 361/785, 361/788, 361/803, 361/736, 439/59, 439/60, 439/346

US-CL-CURRENT: [361/796](#); [361/736](#), [361/785](#), [361/788](#), [361/803](#), [439/346](#), [439/59](#), [439/60](#)

FIELD-OF-SEARCH: 361/728, 361/736, 361/741, 361/752, 361/756, 361/785, 361/788, 361/796, 361/800, 361/802, 361/803, 361/725, 361/727, 439/607-610, 439/60, 439/59, 439/61, 439/64, 439/65, 439/346, 439/374, 439/377, 439/345, 439/621

PRIOR-ART-DISCLOSED:

## U.S. PATENT DOCUMENTS

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PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/> <a href="#">4692120</a>	September 1987	Feinstein	439/62
<input type="checkbox"/> <a href="#">4744006</a>	May 1988	Duffield	361/686

ART-UNIT: 219

PRIMARY-EXAMINER: Kincaid; Kristine L.

ASSISTANT-EXAMINER: Dinkins; Anthony

h   e   b   b   c g   b   c c   e

ATTY-AGENT-FIRM: Harrington; Curtis L.

ABSTRACT:

A computer housing and expansion card design facilitates the addition and removal of expansion cards from the front of a computer housing without disassembly of the housing, and further facilitates the connection of external cables to the expansion cards from the back of the computer housing.

7 Claims, 8 Drawing figures

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L6: Entry 11 of 20

File: USPT

Nov 23, 1999

US-PAT-NO: 5991839

DOCUMENT-IDENTIFIER: US 5991839 A

TITLE: Computer system having computer main body and expansion unit

DATE-ISSUED: November 23, 1999

## INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ninomiya; Ryoji	Tokyo			JP

## ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Kabushiki Kaisha Toshiba	Kawasaki			JP	03

APPL-NO: 08/ 716860   [\[PALM\]](#)

DATE FILED: September 20, 1996

## FOREIGN-APPL-PRIORITY-DATA:

COUNTRY	APPL-NO	APPL-DATE
JP	7-254221	September 29, 1995

INT-CL: [06] [G06 F 13/00](#)

US-CL-ISSUED: 710/101; 710/102, 710/128, 710/129, 710/131, 713/300, 713/310, 713/340

US-CL-CURRENT: [710/303](#); [713/300](#), [713/310](#), [713/340](#)

FIELD-OF-SEARCH: 395/750.01, 395/750.02, 395/750.08, 395/280, 395/281, 395/282, 395/283, 395/284, 395/311, 395/309, 395/308, 710/100, 710/101, 710/102, 710/103, 710/104, 710/128, 710/129, 710/131, 713/300, 713/310, 713/340

PRIOR-ART-DISCLOSED:

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<input type="checkbox"/>	<a href="#">5323291</a>	June 1994	Boyle et al.	361/686
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<input type="checkbox"/>	<u>5598539</u>	January 1997	Gephardt et al.	395/281
<input type="checkbox"/>	<u>5648762</u>	July 1997	Ichimura et al.	340/825.31

## FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	US-CL
59-87526	May 1984	JP	

ART-UNIT: 271

PRIMARY-EXAMINER: Sheikh; Ayaz R.

ASSISTANT-EXAMINER: Etienne; Ario

ATTY-AGENT-FIRM: Oblon, Spivak, McClelland, Maier &amp; Neustadt, P.C.

## ABSTRACT:

A computer main body has a system bus. The system bus is connected to a PCI-DS bridge. A docking station has a plurality of expansion devices for expanding the functions of the computer main body. The computer main body is attached to the docking station by means of the DS-PCI/ISA bridge of the docking station and the PCI-DS bridge of the computer main body, while the expansion devices of the docking station are separated from the bus of the computer main body. The computer main body outputs to the docking station an instruction for starting power supply, after having been attached. After switching on of the docking station has been detected, gates in the bus sides of the DS-PCI/ISA bridge and the PCI-DS bridge are switched ON.

23 Claims, 16 Drawing figures

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☐ 1. Document ID: US 20040039860 A1

Using default format because multiple data bases are involved.

L6: Entry 1 of 20

File: PGPB

Feb 26, 2004

PGPUB-DOCUMENT-NUMBER: 20040039860

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040039860 A1

TITLE: Nested removable-removable modules with game and media-player applications

PUBLICATION-DATE: February 26, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Mills, Kevin J.	Palo Alto	CA	US	
Gifford, Micheal L.	San Leandro	CA	US	

US-CL-CURRENT: 710/301; 711/115

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw De
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☐ 2. Document ID: US 20020169912 A1

L6: Entry 2 of 20

File: PGPB

Nov 14, 2002

PGPUB-DOCUMENT-NUMBER: 20020169912

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020169912 A1

TITLE: First-level removable module having bar code I/O and second-level removable memory

PUBLICATION-DATE: November 14, 2002

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Mills, Kevin J.	Palo Alto	CA	US	
Gifford, Micheal L.	San Leandro	CA	US	

US-CL-CURRENT: 710/301

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KIMC	Draw De
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☐ 3. Document ID: US 20020145847 A1

L6: Entry 3 of 20

File: PGPB

Oct 10, 2002

PGPUB-DOCUMENT-NUMBER: 20020145847

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20020145847 A1

TITLE: Portable computer

PUBLICATION-DATE: October 10, 2002

## INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Crosby, Catherine K.	Alexandria	VA	US	

US-CL-CURRENT: 361/683

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KIMC	Draw De
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☐ 4. Document ID: US 6691196 B2

L6: Entry 4 of 20

File: USPT

Feb 10, 2004

US-PAT-NO: 6691196

DOCUMENT-IDENTIFIER: US 6691196 B2

TITLE: First-level removable module having bar code I/O and second-level removable memory

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KIMC	Draw De
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☐ 5. Document ID: US 6525932 B1

L6: Entry 5 of 20

File: USPT

Feb 25, 2003

US-PAT-NO: 6525932

DOCUMENT-IDENTIFIER: US 6525932 B1

TITLE: Expansion unit and electronic apparatus

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KIMC	Draw De
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☐ 6. Document ID: US 6353870 B1

L6: Entry 6 of 20

File: USPT

Mar 5, 2002

US-PAT-NO: 6353870

DOCUMENT-IDENTIFIER: US 6353870 B1

TITLE: Closed case removable expansion card having interconnect and adapter circuitry for both I/O and removable memory

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw De
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☐ 7. Document ID: US 6105089 A

L6: Entry 7 of 20

File: USPT

Aug 15, 2000

US-PAT-NO: 6105089

DOCUMENT-IDENTIFIER: US 6105089 A

TITLE: Data management system for adding or exchanging components on a running computer

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw De
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☐ 8. Document ID: US 6081207 A

L6: Entry 8 of 20

File: USPT

Jun 27, 2000

US-PAT-NO: 6081207

DOCUMENT-IDENTIFIER: US 6081207 A

TITLE: Multipurpose, folding, portable computer

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw De
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☐ 9. Document ID: US 6058445 A

L6: Entry 9 of 20

File: USPT

May 2, 2000

US-PAT-NO: 6058445

DOCUMENT-IDENTIFIER: US 6058445 A

TITLE: Data management method for adding or exchanging components on a running computer

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw De
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☐ 10. Document ID: US 6011687 A

L6: Entry 10 of 20

File: USPT

Jan 4, 2000

US-PAT-NO: 6011687

DOCUMENT-IDENTIFIER: US 6011687 A

**\*\* See image for Certificate of Correction \*\***



TITLE: Docking station adapter for computer media modules

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	RWC	Draw Ds
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Terms	Documents
L5 and (slot same adapter)	20

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Search Results - Record(s) 11 through 20 of 20 returned.

☐ 11. Document ID: US 5991839 A

Using default format because multiple data bases are involved.

L6: Entry 11 of 20

File: USPT

Nov 23, 1999

US-PAT-NO: 5991839

DOCUMENT-IDENTIFIER: US 5991839 A

TITLE: Computer system having computer main body and expansion unit

DATE-ISSUED: November 23, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ninomiya; Ryoji	Tokyo			JP

US-CL-CURRENT: 710/303; 713/300, 713/310, 713/340

<a href="#">Full</a>	<a href="#">Title</a>	<a href="#">Citation</a>	<a href="#">Front</a>	<a href="#">Review</a>	<a href="#">Classification</a>	<a href="#">Date</a>	<a href="#">Reference</a>	<a href="#">Sequences</a>	<a href="#">Attachments</a>	<a href="#">Claims</a>	<a href="#">KIMC</a>	<a href="#">Drawn De</a>
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☐ 12. Document ID: US 5949643 A

L6: Entry 12 of 20

File: USPT

Sep 7, 1999

US-PAT-NO: 5949643

DOCUMENT-IDENTIFIER: US 5949643 A

TITLE: Portable computer having split keyboard and pivotal display screen halves

<a href="#">Full</a>	<a href="#">Title</a>	<a href="#">Citation</a>	<a href="#">Front</a>	<a href="#">Review</a>	<a href="#">Classification</a>	<a href="#">Date</a>	<a href="#">Reference</a>	<a href="#">Sequences</a>	<a href="#">Attachments</a>	<a href="#">Claims</a>	<a href="#">KIMC</a>	<a href="#">Drawn De</a>
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☐ 13. Document ID: US 5948092 A

L6: Entry 13 of 20

File: USPT

Sep 7, 1999

US-PAT-NO: 5948092

DOCUMENT-IDENTIFIER: US 5948092 A

TITLE: Local bus IDE architecture for a split computer system

<a href="#">Full</a>	<a href="#">Title</a>	<a href="#">Citation</a>	<a href="#">Front</a>	<a href="#">Review</a>	<a href="#">Classification</a>	<a href="#">Date</a>	<a href="#">Reference</a>	<a href="#">Sequences</a>	<a href="#">Attachments</a>	<a href="#">Claims</a>	<a href="#">KIMC</a>	<a href="#">Drawn De</a>
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☐ 14. Document ID: US 5898843 A

L6: Entry 14 of 20

File: USPT

Apr 27, 1999

US-PAT-NO: 5898843

DOCUMENT-IDENTIFIER: US 5898843 A

TITLE: System and method for controlling device which is present in media console and system unit of a split computer system

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 15. Document ID: US 5878271 A

L6: Entry 15 of 20

File: USPT

Mar 2, 1999

US-PAT-NO: 5878271

DOCUMENT-IDENTIFIER: US 5878271 A

TITLE: Multi-conductor cable architecture and interface for a split system personal computer

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 16. Document ID: US 5594873 A

L6: Entry 16 of 20

File: USPT

Jan 14, 1997

US-PAT-NO: 5594873

DOCUMENT-IDENTIFIER: US 5594873 A

TITLE: System and method for identifying expansion devices in a computer system

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 17. Document ID: US 5544008 A

L6: Entry 17 of 20

File: USPT

Aug 6, 1996

US-PAT-NO: 5544008

DOCUMENT-IDENTIFIER: US 5544008 A

TITLE: Computer expansion module apparatus

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw D
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☐ 18. Document ID: US 5297067 A

L6: Entry 18 of 20

File: USPT

Mar 22, 1994

US-PAT-NO: 5297067

DOCUMENT-IDENTIFIER: US 5297067 A

TITLE: Electronic hot connection of disk drive module to computer peripheral bus

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw De
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☐ 19. Document ID: US 5163833 A

L6: Entry 19 of 20

File: USPT

Nov 17, 1992

US-PAT-NO: 5163833

DOCUMENT-IDENTIFIER: US 5163833 A

TITLE: Dual personal computer architecture peripheral adapter board

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw De
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☐ 20. Document ID: US 5162675 A

L6: Entry 20 of 20

File: USPT

Nov 10, 1992

US-PAT-NO: 5162675

DOCUMENT-IDENTIFIER: US 5162675 A

TITLE: Dual personal computer architecture peripheral adapter board and circuit

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw De
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Terms

Documents

L5 and (slot same adapter)

20

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US006691196B2

(12) **United States Patent**  
Mills et al.

(10) Patent No.: **US 6,691,196 B2**  
(45) Date of Patent: **\*Feb. 10, 2004**

(54) **FIRST-LEVEL REMOVABLE MODULE  
HAVING BAR CODE I/O AND  
SECOND-LEVEL REMOVABLE MEMORY**

(75) Inventors: Kevin J. Mills, Palo Alto, CA (US);  
Michael L. Gifford, San Leandro, CA (US)

(73) Assignee: Socket Communications, Inc., Newark, CA (US)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: 10/036,468

(22) Filed: Jan. 7, 2002

(65) Prior Publication Data

US 2002/0169912 A1 Nov. 14, 2002

**Related U.S. Application Data**

(63) Continuation of application No. 09/309,373, filed on May 11, 1999, now Pat. No. 6,353,870.

(51) Int. Cl. G06F 13/00; G06F 1/16

(52) U.S. Cl. 710/301; 710/2; 711/115; 361/684; 361/686

(58) Field of Search 710/300-304, 710/2; 361/679-686; 711/115

(56) **References Cited**

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5,184,282 A	2/1993	Kameda et al.	361/737
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5,491,774 A	2/1996	Morris et al.	395/279
5,519,577 A	5/1996	Dudas et al.	361/737
5,545,057 A	8/1996	Tha et al.	439/540.1

5,530,709 A 8/1996 Iwazaki 361/584

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*CompactFlash Specification Revision 1.3*, CompactFlash Association, 1998.

*PC Cards and CompactFlash Size CF+Cards for Ethernet, Serial Communications, Bar Code Scanning and Data Collection*, Socket Communications, Inc., 1998.

*SanDisk CompactFlash*, SanDisk Corporation, Apr. 1998.

*SanDisk MultiMediaCard*, SanDisk Corporation, Nov. 1997.

Apr. 30, 2001 PCT Written Opinion for related International application No. PCT/US00/12796, filed May 9, 2000.

*Primary Examiner*—Sumati Lefkowitz

(74) *Attorney, Agent, or Firm*—Patent Ventures; Bennett Smith; Korbin Van Dyke

(57) **ABSTRACT**

Computer hosts, such as PDAs, are customized for use in bar code scanner applications through use of a first-level removable expansion module having bar code related circuitry and a slot and internal connector for a second-level removable memory. In combination with a connected or attached I/O device for scanning bar codes, these modules provide embedded bar code scanning I/O adapter and/or application-specific functions as well as second-level removable memory functions. The removable memory may be used to store a backup copy of the scanned data for restoration in the event the original scan data is lost or corrupted. Restoration may occur using any interface compatible with the removable memory. The removable memory may also be used by the bar code scanner application specific circuitry within the first-level removable expansion module. In illustrative embodiments, an industry standard physical and electrical interface couples the application specific module to the computer host, which provides user interface functions for the application.

44 Claims, 15 Drawing Sheets





US006599147B1

(12) **United States Patent**  
Mills et al.

(10) Patent No.: **US 6,599,147 B1**  
(45) Date of Patent: **Jul. 29, 2003**

(54) **HIGH-DENSITY REMOVABLE EXPANSION MODULE HAVING I/O AND SECOND-LEVEL-REMOVABLE EXPANSION MEMORY**

(75) Inventors: Kevin J. Mills, Palo Alto, CA (US);  
Michael L. Clifford, San Leandro, CA (US)

(73) Assignee: Rocket Communications, Inc., Newark, CA (US)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: 09/439,966

(22) Filed: Nov. 12, 1999

**Related U.S. Application Data**

(63) Continuation-in-part of application No. 08/309,973, filed on May 11, 1999, now Pat. No. 6,353,870.

(51) Int. Cl.<sup>7</sup> ..... H01R 13/64

(52) U.S. Cl. .... 439/377; 439/946; 439/76.1

(58) Field of Search ..... 439/377, 946, 439/74, 75, 76.1; 361/737, 752, 796, 683

(56) **References Cited**

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5,184,282 A	2/1993	Kaneda et al.	361/395
5,291,584 A	3/1994	Challa et al.	395/500
5,491,774 A	2/1996	Norris et al.	395/279
5,519,577 A	5/1996	Dudka et al.	361/737
5,545,057 A	8/1996	Tan et al.	439/540.1
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*MultiMediaCard System Summary Version 2.0*, MMCA, Jan. 1999.

*Web Browser, Smart Solutions for Smart Phones*, SanDisk Corporation, 1998.

*CompactFlash Specification Revision 1.3*, CompactFlash Association, 1998.

*PC Cards and CompactFlash Size CF+ Cards and Ethernet, Serial Communications, Bar Code Scanning and Data Collection*, Rocket Communications, Inc., 1998.

*SanDisk CompactFlash*, SanDisk Corporation, Apr. 1998.

*SanDisk MultiMediaCard*, SanDisk Corporation, Nov. 1997.

Apr. 30, 2001 PCT Written Opinion for related International application No. PCT/US00/12798, filed May 9, 2000.

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*Primary Examiner*—P. Austin Bradley  
*Assistant Examiner*—Edwin A. Leola

(74) *Attorney, Agent, or Firm*—Patent Ventures, Bennett Smith, Korbin Van Dyke

(57) **ABSTRACT**

The utility of portable computer hosts, such as PDAs (or handhelds), is enhanced by methods and apparatus for removable expansion cards having application specific circuitry, a second-level-removable memory, and optional I/O, in a number of illustrative embodiments. In addition to providing greater expansion utility in a compact and low profile industrial design, the present invention permits memory configuration versatility for application specific expansion cards, permitting easy user field selection and upgrades of the memory used in conjunction with the expansion card. Finally, from a system perspective, the present invention enables increased parallelism and functionality previously not available to portable computer devices.

36 Claims, 37 Drawing Sheets

